CLAIMS

1. A method for manufacturing a white light-emitting diode element, the method comprising the steps of:

preparing an integral LED material plate corresponding to a plurality of LED chips each of which includes an anode and a cathode electrodes for a blue light-emitting layer, the anode electrode and the cathode electrode being provided respectively at opposite end surfaces of the chip;

bonding the LED material plate to an upper surface of an expansion sheet so that at least either of the cathode electrode and the anode electrode comes into close contact with the expansion sheet;

dicing the LED material plate into individual LED chips while the LED material plate is bonded to the expansion sheet;

stretching the expansion sheet in two directions which are perpendicular to each other along a surface so that a spacing between adjacent LED chips is widened;

forming a light-pervious synthetic resin layer containing a fluorescent material on the upper surface of the expansion sheet so that each of the LED chips is embedded in the synthetic resin layer up to the electrode on an upper surface of the LED chip;

dicing the synthetic resin layer to remove portions of the synthetic resin layer between adjacent LED chips by a cutting width which is smaller than the spacing distance between side surfaces of adjacent LED chips; and

detaching the LED chips from the expansion sheet.

2. The method for manufacturing a white light-emitting diode element according to claim 1, wherein the dicing of the LED material plate into individual LED chips comprises forming an inclined surface at a side surface of each of the LED chips, the inclined surface being inclined from one electrode film toward the other electrode film.

3. The method for manufacturing a white light-emitting diode element according to claim 1 or 2, wherein each of the LED chips includes a light reflective layer on an upper side of the light-emitting layer.

4. A method for manufacturing a white light-emitting diode element, the method comprising the steps of:

preparing an integral LED material plate corresponding to a plurality of LED chips each of which includes an anode and a cathode electrodes for a blue light-emitting layer, the anode electrode and the cathode electrode being provided at an end surface of the LED chip;

bonding the LED material plate to an upper surface of an expansion sheet so that the cathode electrode and the anode electrode come into close contact with the expansion sheet;

dicing the LED material plate into individual LED chips while the LED material plate is bonded to the expansion sheet;

stretching the expansion sheet in two directions which

are perpendicular to each other along a surface so that a spacing between adjacent LED chips is widened;

forming a light-pervious synthetic resin layer containing a fluorescent material on the upper surface of the expansion sheet so that each of the LED chips is embedded in the synthetic resin layer at least up to a side surface;

dicing the synthetic resin layer to remove portions of the synthetic resin layer between adjacent LED chips by a cutting width which is smaller than the spacing distance between side surfaces of adjacent LED chips; and

detaching the LED chips from the expansion sheet.